Messrs. Scott, Greenwood and Son announce:—"Modern Flax, Hemp, and Jute Spinning and Twisting," by H. R. Carter, illustrated; "Industrial Alcohol," by J. G. M'Intosh, illustrated; "The Treatment of Paper, for Special Purposes," by L. E. Andes, illustrated; "Celluloid: its Raw Material, Manufacture, Properties, and Uses," by Dr. F. Bockmann, translated, illustrated; "Three Hundred Shades and How to Mix Them," by A. Desaint, plates; "The Paper Mill Chemist," by Dr. H. P. Stevens, illustrated; "Recipes for the Preserving of Fruit, Vegetables, and Meat," by E. Wagner, translated, illustrated; "Pottery Decorating," by R. Hainbach, illustrated; "Manufacture and Comparative Merits of White Lead and Zinc White Paints," by G. Petit; and "Electric Wiring and Fitting for Plumbers and Gasfitters," by S. F. Walker, illustrated.

The Walter Scott Publishing Company, Ltd., direct attention to:—"Race Culture: or, Race Suicide?" by Dr. R. R. Rentoul; and "The Lungs: in Health and Disease," by Dr. P. Niemeyer, translated by B. H. Hall, illustrated.

Messrs. Swan Sonnenschein and Co., Ltd., announce:—"The Port of London and the Thames Barrage: a Series of Expert Studies and Reports," edited by T. W. Barber, illustrated; "The Student's Text-book of Zoology," by Prof. A. Sedgwick, F.R.S., vol. iii., completing the work, illustrated; and a new edition of "Elementary Text-book of Practical Botany for the Botanical Laboratory and Private Student," by Prof. E. Strasburger, translated by Prof. W. Hillhouse.

Mr. E. Stanford gives notice of:—"The Elements of Geography," by J. H. N. Stephenson, part i.

The list of the University Tutorial Press contains:—"The Science of Speech: a Full Account of the Structure and Use of the Vocal Organs and the Means of Securing Distinct Articulation," by H. H. Hulbert, illustrated; "The Theory and Practice of Perspective Drawing," by S. Polak; "Certificate Hygiene: a Course of School Hygiene for Teachers, dealing with Sanitation, Physical Training, Food, Drink, Clothing, Fresh Air, Work, Rest, &c.," by R. A. Lyster; and "Junior Chemistry: a Text-book of Experimental Chemistry on Modern Lines," by R. H. Adie.

Mr. T. Fisher Unwin announces:—"Last Hours with Nature," by Mrs. Brightwen, edited by W. H. Chesson, illustrated; "Eliza Brightwen: the Life and Thoughts of a Naturalist," edited by W. H. Chesson, illustrated; "The Matterhorn," by G. Rey, illustrated by E. Rubino, translated from the Italian by J. E. C. Eaton, illustrated; "The Andes and the Amazon: Life and Travel in Peru," by C. R. Enock, illustrated.

The list of Messrs. Vinton and Co., Ltd., contains:—"The Mare and Foal and their Treatment"; "Milch Goats: Breeds and Management"; "Dogs: Breeds and Management"; "Poultry: Breeds and Management"; "Fifty Years among Shorthorns," by R. Bruce; and "The History of Shorthorn Cattle," edited by J. Sinclair.

Messrs. Watts and Co. will issue:—"The Picture Book of Evolution," by D. Hird, part ii.

Messrs. Whittaker and Co.'s announcements comprise:—"The Metric and British Systems of Weights, Measures, and Coinage," by Dr. F. M. Perkin; "Moving Loads on Railway Under Bridges," by H. Bamford; "Principles of Electrical Engineering (Direct Current)." by J. R. Barr; "Steel Works Analysis," by Prof. J. O. Arnold and F. Ibbotson; Whittaker's "Arithmetic of Electrical Engineering"; "Modern Practice of Coal Mining," by D. Burns and G. L. Kerr, parts ii. and iii.; "Electricity in Mining," by P. R. Allen; and "Advanced Text-book on Steam, Gas, and Oil Engines," by J. W. Hayward.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The Public Orator, Dr. Sandys, spoke as follows on October 1 in presenting to the Vice-Chancellor the several recipients of honorary degrees on the occasion of the visit of the guests of the Geological Society of London:—

Dignissime Domine, Domine Procancellarie, et tota Academia.

Societatis Geologicae Londiniensis hospites, hesterno die ad nos paulisper advectos, omnes etiam nostrorum hospitum in numero libenter computamus; omnes, scientiarum in hac sede venerabili e tot orbis terrarum partibus praesentes, non sine fraterno quodam animi motu contemplamur. "Saxa et solitudines voci respondent": quanto magis nos, litterarum humaniorum et scientiarum amore imbuti, eorum adventu vehementer commovemur, qui scientia quadam admirabili praediti, etiam ex ipsis saxis rerum naturae veritatem extorquent! Hospitibus nostris omnibus patent hodie Musea nostra, patent Collegia nostra omnia, patent omnium corda. In hoc templo denique honoris; dum hospites nostros omnes, e tot terris advectos, ea qua par est observantia excipimus, nonnullos, gentis uniuscuiusque quasi legatos praecipuos, titulo nostro velut exempli causa decoramus, qui honos aliorum hospitum insignium praesentia illustratus, vestrum omnium plausu sine dubio comprobabitur.

(1) Christiania ad nos misit Universitatis suae Rectorem, geologiae professorem insignem, qui patriae in rupibus et metallis explorandis non sine laude iamdudum exercitatus, Norwegiae australis praesertim de saxis igneis praeclare disputavit. Iuvat videre virum patriae devotissimum, virum Regni novi senatoribus adscriptum, virum denique gentis totius Universitatis legatum auspiciis optimis nominatum.

Doctorum nostrorum in serie primus hodie incedit WALDEMAR CHRISTOPHER BRÖGGER.

(2) Assurgit deinceps Saxoniae explorator indefessus, Universitatis Lipsiensis professor eximius, qui Germania e septentrionali oriundus, palaeontologiae imprimis usus auxilio, Saxoniae in saxis serie perpetua ordinandis diu feliciter occupatus est. Idem geologiae in elementis enarrandis quantum excellit! Rerum naturae in penetralibus suo Marte explorandis quam fortis est! Rerum naturae in miraculis et observandis et explicandis quam subtilis!

Praesentatur vobis Regni Saxonici unus e Consiliariis, geologiae professor Lipsiensis, HERMANN CREDNER.

(3) Progreditur proximus Musei Bruxellensis curator sollertissimus, vir in palaeontologia vertebrata (ut aiunt) investiganda diligentissimus. Meministis arte quali, ossibus immensis ordine apto collocatis, bestiam illam immanem, Iguanodon Bernissartensem, in speciem suam pristinam restituerit, cuius effigiem accuratissime expressam, et zoölogiae in Museo nostro positam, Belgarum Regis liberalitati acceptam rettulimus.

Nostri in Regem illum animi grati testimonium hodie sine dubio libenter audiet unus e ministris eius fidelissimis, LUDOVICUS DOLLO.

(4) Francogallorum respublica maxima, vicinitatis vinculis nobiscum consociata, trans fretum angustum, nonnullis tam formidolosum, ad litora nostra legatum transmisit acceptissimum. Hospes autem noster, qui Normannorum in provincia superiore vallem quandam viridem olim ab oceano denudatam penitus perscrutatus est, in Instituto Catholico Parisiensi geologiam praeclare profitetur. Scientiae vero illius in Actis edendis diu occupatus, Scientiarum ab Academia, viri magni in locum, epistolarum minister perpetuus nuper est electus. Idem stili lucidi perspicuitate et verborum aptorum venustate insignis, opus ingens, summi laboris, summi acuminis monumentum, scientiae suae studiosis dedicavit, cuius in ipso limine professorem quendam Germanum, operis tanti aemulum generosissimum, aperte atque ingenue collaudat, qui, tempore eodem, laudis titulo eodem a nobis iure optima exornatur.

Laudis eiusdem socius merito declaratur ALBERTUS AUGUSTUS DE LAPPARENT.

(5) Germaniae quidem e legatis alterum hodie non sine dolore desideramus, Scandinaviae vero legatum alterum non sine gaudio salutamus. Salutamus professorem, cuius Regem illustrem inter doctores nostros iamdudum libenter numeravimus, cuius popularem insignem, Linnaeum, cum orbe terrarum toto nuper celebravimus. Hodie vero Florae antiquae potius quam hodiernae antistitem decoramus, qui scientiarum ardens amore, saepenumero etiam caeli arctoi frigora fortiter toleravit. Talium virorum auxilio vetera illa poetae Romani verba denuo vera redduntur:—

"Venient annis saecula seris,
Quibus Oceanus vincula rerum
Laxet, et ingens pateat tellus,
Tethysque novos detegat orbes,
Nec sit terris ultima Thule."

Interim velut ultimam Thulen hodie nobis repraesentat doctorum nostrorum illustrium in serie supremus, poli arctoi indagator audax, ALFREDUS GABRIEL NATHORST.

Mr. Augustine Henry, reader in forestry, will deliver his inaugural lecture in the Botany School lecture theatre on Tuesday, October 15, at 5 p.m.

On the nomination of the special board for mathematics, Dr. Glaisher has been appointed an elector to the Isaac Newton studentships until September 30, 1911.

OXFORD.—In the Convocation held on September 30 the degree of D.Sc., *honoris causa*, was conferred upon a number of distinguished foreign geologists who had attended the centenary celebration of the Geological Society, and also upon Dr. Ludwig Mond, who was nominated by the Chancellor for the degree at the last commemoration, but was at that time unable to attend. The following is the text of the speeches delivered by Prof. Love in presenting them for the degree:—

PROF. C. BARROIS.

Aristoteles auctor est ubi hodie terra sit fuisse pontum, ubi pontus terram. Has vicissitudines testantur ipsa e quibus terra constat elementa, *φωνήεντα ξυνετοῖσι*, sed multorum operam rei ubique incumbentium requirentia ut recte intelligantur. Cum harum rerum investigatores unum in locum aliquando congregari soleant, quo melius quid profectum sit recognoscant, quid egendum sit deliberent, paucos ex eiusmodi conventu laudem singularem adeptos hodie ornat Academia nostra.

Inter Gallos qui geologiæ student fere illustrissimus est Carolus Barrois. Qui vir cum longos saxorum tractus scrutaretur, aliam superficiei structuram esse vidit, aliam medullarum: unde duo saxorum genera distinguere potuit, hæc ignea vi conflata, illa sub vadis, quibus Galliæ pars magna olim opplebatur, sensim concreta. Idem cretæ naturam rimatus, quæ apud nos et apud Gallos perexiguo freto divisos invenitur, nova indicia nactus est unde maris lati et profundi, quo utraque terra olim tegebatur, et incessum et regressum lentum ostenderet.

PROF. A. HEIM.

Qui hodie de vi occulta qua montium iuga super planitiem elata fuerint optime disserunt auctorem sequuntur Albertum Heim. Hic ille est Alpium suarum investigator qui, cum singulorum iugorum, e quibus hæc vasta compages constat, anfractus ramosque perlustrasset, terræ defectus quibus hæ regiones aliquando vexantur, concretas glaciei moles quibus superiora vallium obsidentur, prona montium obteguntur, diligentissime observasset, descriptionem Alpium tabulis pulcherrimis expressam confecit, laboris et fructum et testimonium non pœnitendum.

PROF. A. LACROIX.

Saxorum ignea vi conflatorum varia genera distinguere et quasi in classes distribuere potuit Alfredus Lacroix. Hic ille est qui quattuor abhinc annos monte Peleo vi immani convulso a Galliæ gubernatoribus eo missus est ut nubium ardentium naturam cognosceret: qua in legatione valde periculosa cum appropinquanti exitium flammæ minarentur, mariti virtutem æquavit coniux, quam honoris causa nomino, periculorum olim, nunc laudis socia. Ne multa. Felicissime rem egit vir fortis et sagax, qui harum nebularum natura bene explorata reversus est.

PROF. A. PENCK.

Intercessisse tempora quædam cum terra summo frigore oppressa fuerit nemo nescit. Ultimam quidem ex his quasi periodis, quæ una erat e pluribus quas hic orbis terræ passus est, ex quo animantium sæcula exorta sunt, plurimi pertractaverunt, nemo ex his qui hodie Europam incolunt melius quam Albertus Penck. Cum enim hac periodo exeunte hominem super agros caput extulisse constet, hic noster exstitit qui humani generis vetustatem ultimam illustraret, cum inter variarum gentium instrumentis lapideis utentium tempora et eventus quibus vasti Europæ tractus glacie purgarentur rationem intercedere doceret.

PROF. H. REUSCH.

De Scandinaviæ geologia optime egit Hans Reusch. Qui vir, cum in Norvegia saxa quædam invenirentur innumerabilibus ante sæculis mari terram operiente sensim concreta, deinde vi ignea adeo liquefacta et mutata ut nulla omnino animalium vestigia exhiberent, ipse rationes novas commentatus eiusmodi indicia deprehendit, unde saxorum ætatem colligere potuit. Ostendit etiam Norvegiam vastissimis glaciei molibus antiquitus fere obtectam esse, ex quo patet etiam in vetustate ultima magnis caloris et frigoris vicibus obnoxiam fuisse terram.

PROF. F. ZIRKEL.

Qui illud Scientiæ Naturalis genus pertractant quod ad metallorum saxorumque structuram pertinet Ferdinando Zirkel fere omnia accepta referenda censent, cum microscopo, ut cum physicis loquar, hac in re primus usus sit. Neque satis erat ei nova huic rei studentibus subsidia parare, ipse enim in hoc genere plurimum profecit, cuius doctrinam et peritiam testatur maximus ille de Petrologia liber luculentissime conscriptus.

DR. L. MOND.

"Magnum vectigal est parsimonia" dixit Tullius, quod etiam in Chemia valere sensit Ludovicus Mond. Cum enim id agunt chemici ut certum aliquod elementum a ceteris secernant, restant tanquam rediviva quædam, quæ saepe magni pretii sunt. Multos iam annos hic vir varios modos commentatus est, quibus corpuscula ab aliis spreta, tanquam inutilia, in usum converteret. Ita parcendo dives factus Scientiam Naturalem omni liberalitatis genere coluit. Maximum Londinii laboratorium Humphredo Davy et Michaeli Faraday, Chemiæ et Physicæ auctoribus clarissimis dedicatum, ædificavit et muneribus locupletavit: idem Societati Regali catalogum maximum, in quo omnia ab omnibus in quovis scientiæ genere his centum annis reperta continerentur, conficiendum et typis imprimendum curanti pecunia subvenit.

THE Association of Technical Institutions offers two prizes, each of 25*l*., for the two best essays, one on "The Bearing of Technical Education on Industrial Progress," and the other on "The Bearing of Technical Education on Agriculture and on Industries of a Rural Character." Particulars of the conditions may be obtained from Dr. Clay, Northern Polytechnic, Holloway, London, N.

A COURSE of eight lectures on "Certain Fundamental Problems in Physiology common to Animals and Plants" will be given by Dr. W. M. Bayliss, F.R.S., at University College (University of London) on Wednesdays, at 5 p.m., beginning October 23. The lectures are open to all students of the University of London; also to qualified medical men and to such other persons as are specially admitted.

PROF. W. C. MCINTOSH, F.R.S., professor of natural history in the University of St. Andrews, in July last presented the University museum with 3150 spirit preparations, large and small. The preparations consist of (1) a named series (about 1150 in number) illustrating the marine zoology of St. Andrews—the types of the "Invertebrate Marine Fauna and Fishes" of St. Andrews, 1875; (2) a glazed cabinet illustrating the development and life-history of the salmon of the Tay in ninety-five preparations; (3) a reference series (265 in number) from the trawling expeditions of 1884, each station showing both fishes and invertebrates; (4) a general zoological collection in spirit (consisting of about 1595 specimens), chiefly marine, from Shetland to the Channel Islands, but also including a considerable number of amphibians, reptiles, birds, and mammals; (5) forty-five typical botanical preparations, including a fine series of pitcher plants with their insects.

THE programme of day and evening classes at the Woolwich Polytechnic during the session 1907–8 has been received. The volume contains the usual syllabuses of subjects studied at the polytechnic, and particulars of the examination requirements of London University, Board of Education, and other examining bodies. We are glad to see here and there short notes as to the value of preliminary scientific education to the student of technology. Thus, it is pointed out that a sound knowledge of mathematics is the surest basis for satisfactory progress in mechanical and physical science. In the physical department, all students are required to attend both the lecture and the laboratory course in each class; and students of electrical engineering must attend classes in electricity and magnetism concurrently if they have no knowledge of the principles of electrical science. Systematic courses of study extending over three or more years are arranged in various branches of technology; and the time-tables of these courses should be useful as a guide to serious students. We notice the announcement that the governors are desirous that no young man or woman shall be deprived of the advantages of the instruction given in the polytechnic, on the ground of inability to pay the fees. The principal is authorised to admit students free who desire to attend any of the classes and to work steadily, but are unable to pay the necessary fees.

THE distribution of medals, prizes, and certificates to students of the Royal College of Science on Thursday last was made the occasion of several references to the charter of incorporation of the Imperial College of Science and Technology. The Dean, Prof. W. A. Tilden, trusts that by the end of the year everything will be ready for the transfer of authority which is to take place from the Board of Education to the governing body of the Imperial College on January 1 next. In his address to the students, Mr. A. H. D. Acland said that in the forwarding of technology this country has been lamentably backward. Scientific knowledge is at the very root of the prosperity of the Empire. If determined efforts are made a great national institution will be established of which the country will really be proud. Mr. Acland advised the students to do something to study the great masterpieces of the English language. He remarked that in later life, when they have to make reports, as all men in scientific life must do, they will often find that the study of the English language will not have been altogether useless, even at the present stage of their education. Mr. Acland also advised the students to travel when it is possible for them to do so. Scientific men do a great deal by their interchange of ideas between this and foreign countries to forward that which we all desire—international friendliness. Prof. Dalby, Dean of the Central Technical College of the City and Guilds of London Institute, referred to the union which is to take place between the three colleges; and Sir William White said that to put the charter in practical form it is necessary to recognise all that has been done in the past, to utilise fully all that exists, and to bring the whole of the higher technical instruction into one harmonious and sympathetic working whole.

A STRONG plea for the establishment of a university for Bristol and the West of England was made by Prof. F. Gotch, F.R.S., at the annual distribution of prizes to the students of the faculty of medicine of the University College of that city on October 1. Prof. Gotch pointed out that the geographical position of Bristol, her civic prosperity, and her educational institutions are such that there is no excuse for further delay. It is time for the city to realise that in higher education the organisation of her teaching resources is a matter of momentous importance, and that the way to attain this is to segregate all her scattered educational efforts in a university. Surely the citizens of Bristol are as enlightened and generous as those of Liverpool, Manchester, Birmingham, Leeds, and Sheffield; and the fact that the city has not also a university of its own must be because the difference between a college and a university is not understood. A university possesses greater educational stability, and, in consequence, greater educational efficiency. It segregates all the higher educational enterprises of the district, rivalry gives place to cooperation, general interest is thus awakened, and it is sustained by the knowledge that, having become a working partner in a great enterprise, it must at all hazards be made a success. The credit of the community is then at stake, thus ensuring its proper support; and since the enterprise has, from the educational point of view, attained a new level, it is viewed from a different and a higher standpoint. Another conspicuous feature of a university is the freedom which it enjoys. The possession of the power to give a degree carries with it a matter of enormous freedom. Collegiate teaching has to follow along lines prescribed by those bodies which give degrees, and such prescription stifles educational development, because the teacher has no voice in the matter. A further feature of a local university is the enlargement of the area of educational responsibility. The pride which the citizens of Liverpool and Birmingham have in their universities is due to their proprietary interest in them. A university would thus become the dominant educational force and pride of Bristol and all the surrounding district. The last feature of a university, as distinct from a college, is one which will in the end carry on its broad back all the others: it is prestige. So long as Bristol only possesses a college, she will from the standpoint of higher education have but little general prestige. The fault does not lie with the character of the collegiate teaching, the size of the buildings, or the equipment of the scientific laboratories. So long as the college continues to remain in its present condition, so long will it not only gain no prestige, but may begin to lose what prestige it now possesses. Those who take over wider university responsibilities are felt to be possessed by the spirit of the age, and are duly honoured, whilst those who hesitate to do so are felt to be without this spirit, and lose their position.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, received June 8.—"On Luminous Efficiency and the Mechanical Equivalent of Light." By Dr. Charles V. **Drysdale**. Communicated by Prof. Silvanus P. Thompson, F.R.S.

The paper first directs attention to the fact that the term luminous efficiency requires more rigorous definition. If Q is the total power consumption of the source, R the total radiation $= \int_0^\infty I_\lambda d\lambda$, and L the luminous radiation $= \int_{\lambda_1}^{\lambda_2} I_\lambda d\lambda$, the luminous efficiency is generally taken to mean the ratio L/Q. In many cases, however, the ratio L/R, which has been termed by Nichols the radiant efficiency, is determined. Neither of these definitions is entirely satisfactory from the practical point of view, as a source might apparently be of high efficiency if its radiation were confined within the visible spectrum, but near to either end of the spectrum, where the luminosity is low. A better definition is that of Dr. Guilleaume, which may be termed the reduced luminous efficiency L_λ/Q, where L_λ is the equivalent radiation of the most effective form required to give the same light emission. In order to obtain the latter quantity it is necessary to determine the mechanical equivalent of the most effective luminous radiation which is in the neighbourhood of $\lambda = 0{\cdot}54\ \mu$.

For the measurement of the mechanical equivalent a spectrum was formed by a carbon bisulphide prism, and a combined photometric and bolometric arrangement was made to enable the luminosity of any part of the spectrum to be measured, and the radiation to be compared with that from a glow lamp radiating a known amount of power. By means of a movable screen the radiation from the spectrum or from the source of radiation could be intercepted alternately, and the radiation from the comparison source altered until no effect was observed on